CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: Public Safety, Finance and Strategic Support Committee

FROM: Stephen R. Ferguson
Chief Information Officer

SUBJECT: **Report on Infrastructure – Priority Projects**

DATE: February 5, 2009

Approved Date 2/10/09

Background

On October 16, 2008, the Chief Information Officer presented a report to the Public Safety, Finance and Strategic Support Committee on Priority Projects for Technical Infrastructure. This memorandum provides the Committee with an update on the priority projects still in progress, as identified in the previous report. This report also provides the Committee with a look ahead at future issues and/or projects.

Executive Overview

The City of San José's Information Technology Department (ITD) is responsible for managing the data and voice infrastructure throughout the organization. This infrastructure serves as the technical backbone, supporting such Citywide applications as HR/Payroll, email, FMS, Call Center(s), and Utility Billing Applications just to name a few. A wide variety of departmental applications also use the voice and data infrastructure to meet their primary business objectives.

The technical infrastructure must support the demands of users who rely upon it to perform their daily work. For example, employees send and receive nearly one million email messages daily while transacting City business. This volume of traffic and the availability of email represent only a single communications format that customers use to do business with the City of San José. Electronic mail, along with other forms of data, is only as reliable as the underlying infrastructure that is in place. ITD is currently focusing on three keys areas of improvement for the City's technical infrastructure:

- Voice and Data Consistency – The Voice and Data Communications Strategy is a priority that focuses on consistency of the City's computing environment. At the heart of this strategy is the development of a reliable and secure network. This single network is the way in which ITD manages user accounts and email (Active Directory) and deployment of Voice over Internet Protocol (VoIP) throughout the organization. With the completion of the rollout, currently underway, employees will have a consistent base level of supporting technology within the City, regardless of department affiliation or physical location.

- Green IT Operations – The Green Strategy for IT operations leverages the normal replacement schedules of technology assets with the most recent technological advancements. These advancements, along with the decision to use more "virtual" rather than "physical" servers will produce a reduction in energy consumption and CO^2 emissions. Finally, strong partnerships will allow greater gains in the area of virtualization in tight economic times.

- Streamlining Operations in Preparation for Budget Impacts – The ITD department is reviewing operations in preparation for a reduction in resources related to the 2009-10 budget.

These three major initiatives will provide the greatest impact on City operations from a data and voice infrastructure perspective. ITD continues to strive to provide customers with reliable and productive communication abilities that minimize impacts on the environment, and maximizes integrity of the data contained within.

Priority Projects

Voice and Data Communications

The City's voice and data communications strategy provides the foundation for services that employees, residents and businesses rely upon. At the heart of these services is the wired and wireless infrastructure maintained by ITD. This infrastructure allows for the interoperability of voice and data services between users in support of service delivery. Several key projects are underway that facilitate expanding or enhancing this vital communication medium.

Development of a Single Citywide Network – ITD is currently in the process of designing and deploying a single City network, allowing users to access Citywide services regardless of location or department. At the heart of this network will be a single authentication model (Active Directory) and converged network or Voice over Internet Protocol (VoIP). These core components will provide users with a consistent, predictable and productive computing environment that also enhances the organization's information security. By consolidating departmental differences in authentication, the exchange of data between departments will be streamlined. As of January 24th, 2009, 100% of the City has been moved to Active Directory (AD) and the upgraded email platform. The multi-year project is now complete and has transitioned to standard operations and maintenance. The City initially received quotes pricing the project at $6-9 million for external consultants to complete, with quotes based on organizations of similar size and complexity. The AD project was instead performed at considerable savings by internal ITD staff resources, working cooperatively with staff from other City departments, supported by very minimal assistance from outside contractors.

Finally, VoIP deployments have reached 51% or 3089 lines with the total number of phone lines within the organization being 5989. With the completion of the current Police VoIP project in June 2009, those numbers will rise to approximately 68% or 4089 lines.

Wide Area Network (WAN) Assessment – ITD has completed a WAN assessment to ensure that the necessary foundation work is in place to support a single Citywide Network. As part of the WAN assessment, communications links to outlying City facilities such as Fire Stations, Community Centers and remote City facilitates were reviewed for appropriate bandwidth requirements. The assessment focused on the number of users, computers, applications and services required, and identified the appropriate capacity required for each site. Included in this assessment was the opportunity to leverage City-owned fiber networks through the Department of Transportation (DOT). ITD and DOT are working cooperatively to identify opportunities for integration. As a result of the WAN assessment, ITD and DOT have identified the following three priority fiber connectivity projects based on existing staffing resources within both departments:

1. Police Department Substation
2. Happy Hollow Park and Zoo
3. 55 South Market Street (MAE WEST)

Police Communications Campus Wiring – The need for a crucial network and infrastructure upgrade for the Police Communications Campus was identified by ITD during preparation for expansion of the converged network. For this reason, $2 million of the Technology Reserve, initially targeted for other under-resourced areas, was recommended for this essential project and was approved as part of the 2007-2008 Operating Budget. Currently, the Police Communications Campus (PAC) cable pulls are 90% complete, and the Police Administration Building (PAB) is 60% complete. The total project is approximately 75% complete and is currently on track to finish two months early and within budget. The fiber pull between City Hall and PAB/PAC was completed on time and within budget.

Police Substation Fiber Connectivity – The new Police Substation is scheduled for completion in Fall of 2009. In preparation for the opening, ITD, Public Works, DOT and the Police Department are working toward provision of high speed connectivity between the two Police buildings. This communications link will eventually facilitate secondary and emergency operations of Public Safety services in the event that either site becomes unavailable. At present, the City is working on contract language to facilitate running conduit under Union Pacific Rail Road (UPRR) tracks at Monterey Highway which is required to complete the project.

VoIP Deployment at the Police Campus – In addition to wiring being performed at the Police campus, work on the new voice and data network is in progress. With this new network, VoIP will be expanded to the campus and a new network backbone will be implemented to replace equipment at or near end-of-life that supports such critical operations as the new electronic citation program, mobile broadband and others. The

equipment has been procured and the initial kickoff between IT and the Police Department has been completed. At present, the IT and Police Departments are developing a lab environment to test operational and security needs. The anticipated completion date of this project is approximately June 2009.

Storage Area Network (SAN) – ITD and Finance/Purchasing released an RFP for a Storage Area Network (SAN). A SAN is a pool of storage (hard drives) that is centrally managed, allocated and backed up. The City currently buys storage in small increments with each server purchase. By leveraging the storage pool concept, the City will be able to reduce the amount of administrative time spent providing operations and maintenance of its data storage environment. In addition, the SAN project will focus on consolidation of redundant server functionality which will contribute to the reduction of power consumption within the Data Center as the department's strategy of "virtualizing" servers whenever feasible continues.

As a result of the RFP process, the City selected and procured an HP SAN solution proposed by STA to meet the storage demands of the City. The SAN equipment has been delivered and installed. Final user acceptance testing is anticipated by April 7th.

Citywide Wireless – The City of San José continues to actively participate in the Joint Venture Wireless Silicon Valley Project. ITD continues to monitor the development of new business models in the marketplace for municipal wireless and their impact on the economic vitality of the region.

Downtown Wireless – The City of San José received notice in late April 2008 that the free WiFi network downtown would be ceasing operations. After careful consideration with key stakeholders such as the Department of Transportation, Redevelopment Agency, Office of Economic Development and Team San José, it was determined that it would serve the City's best interests to purchase the assets of the network and continue its operations with an outside vendor and in-house staff. The City now owns the assets of the downtown WiFi network and recently brought SmartWave Technologies on board for operations and maintenance of the network. Currently, SmartWave and IT staff are finalizing the support matrix and performing an operational assessment of the assets procured from MetroFi.

Green Technology Strategy for IT Operations

In recent years, the technology industry has embraced the concept of environmental responsibility in the development of hardware and software. As a result, an entire cottage industry has developed to lower energy consumption and CO^2 emissions with regards to technology. With nearly all major manufacturers accepting their roles toward environmental stewardship, a unique opportunity has arisen. In alignment with the City Council's Green Vision, ITD is actively pursuing opportunities to leverage such advancements in continuing

efforts to "green" the San José's technology operations. The following will provide an update on the Green Technology Strategy for IT Operations:

Desktop Power Management – With approximately 6,000 desktop PCs, the City has an excellent opportunity to reduce power consumption by placing PCs under power management. PCs under power management turn off the monitor and CPU after a designated period of inactivity from the end-user. In partnership with ESD, the Information Technology Department has applied for an Association of Bay Area Governments (ABAG) rebate of approximately $10,000 as part of the first phase of computer power management within the City.

Consolidate physical to virtual servers – ITD is already using VMware (virtualization software) to consolidate under-utilized servers. This software allows the City to consolidate applications and services that do not take full advantage of their respective hardware. At present, the City has many applications that would benefit from consolidation, including test and development environments, that are critical but may have very low demands on hardware. The industry itself recognizes that many applications and services cannot, or do not, require the full resources of a server and therefore may be consolidated lowering energy consumption within a Data Center. By expanding our virtualization strategy, the City will lower power consumption and eliminate many future server purchases. This practice will expand as the SAN project is implemented. PG&E will evaluate the effectiveness of the consolidation.

Optimize Data Centers – ITD and General Services have been working closely with PG&E to identify opportunities to leverage best practices with regards to the City's Data Center(s). PG&E is reviewing the components of the HVAC and electrical systems to identify areas for potential improvement. These services are being provided at no cost to the City. However, the changing electrical and HVAC requirements associated with the SAN project have caused this project to be placed on a temporary hold. With the completion of the SAN project, optimization of the Data Centers' HVAC and electrical systems will resume.

A 2009 Look Ahead

Nortel Bankruptcy

On January 14, 2009, the City became aware that Nortel Networks, the City's provider of network and telecommunications equipment for VoIP deployments, filed for bankruptcy protection. The IT Department is in regular and close communication with Nortel, and at present, does not expect to see any change in delivery of goods or services delivered by Nortel. Invoices for goods are paid only after being received, and services are paid on a monthly basis with standard net/30 terms. In the coming months, the IT department will continue to work closely with Nortel in order to better understand the restructuring plan and identify any potential impacts to the City.

Google Apps Proof-of-Concept

As part of Technological Outreach directed in the 2008 Mayor's March Budget message, ITD has begun working with Councilmember Oliverio in the exploration of opportunities to work with the technology community. As part of this outreach effort, ITD and Councilmember Oliverio met with Google on December 11, 2008 to discuss potential beneficial opportunities to partner in delivering City services to both employees and citizens within San José. Based on this meeting, the IT department will be moving forward with a 50 user proof-of-concept of Google Apps. The goal of the pilot is to determine the following:

- Integration with City business requirements
- Cost vs. functionality in a SaaS model
- Technical support matrix in a SaaS model
- Total cost of ownership of Google Apps vs. current practices vs. other hosted solutions
- Determine if a wider pilot is necessary

The entire cost of the proof-of-concept is approximately $2500 for a one year subscription. The Public Safety, Finance and Strategic Support Committee will be provided with future updates as the project progresses. ITD would like to take this opportunity to thank Councilmember Oliverio for his critical involvement in these outreach efforts, and foresight to recognize the potential benefits to the City from evolving technologies and partnership opportunities with our business neighbors.

Blade Server Virtualization Pilot

The Information Technology Department will be partnering with SuperMicro, a San Jose-based manufacturer of green blade server technology, to pilot server virtualization in a blade environment. It is anticipated the cost of the pilot will be less than $100,000. The scope of the pilot is to physically consolidate any servers within the City Hall Data Center that are either outside the warranty period or at end-of-life. It is anticipated that nearly one half of the servers in the Data Center, approximately 150 servers, are targeted for virtualization in the pilot. At a conservative estimate of $6000 to $7000 per server, the cost of replacing, rather than virtualizing the 150 end-of-life servers, would be $900,000 to $1M.

CONCLUSION

The primary cost-saving strategies that are currently being employed by the IT department are:

- Reduction in duplicative services through the consolidation of resources
- Standardization of the computing environment
- Alternative service delivery mechanisms (e.g. SaaS)
- Reduction in areas of overlap between ITD and departmental technical staff
- Cost savings and environmental responsibility through implementation of green technologies

However, this year's budgetary picture and ITD's budget targets have forced the department to reassess services as we prepare to scale back for 2009-10. Resource reductions and a "shrink to core" approach have become compulsory. The magnitude of the budget reductions requested of ITD, a department already under-resourced, will critically impact and/or eliminate its capacity to respond to the organization's demand for technical support. Equally as important, ITD will be unable to respond to the needs of departments as they seek efficiencies through the automation of business processes as part of their own budget-reducing strategies.

Should you have any questions regarding the projects discussed in this memo, please contact Vijay Sammeta, Deputy Director of Technical Infrastructure, at x53566.

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